PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Walter STIEGLBAUER ET AL 6 PCT SERIAL **NO.:** 10/587,152

FILED: JULY 25, 2006 GROUP: 3742

EXAMINER: Ket **D.** DANG

TITLE: DEVICE AND METHOD FOR TRANSPORTING A WELDING ROD

AMENDMENT IN RESPONSE TO OFFICE ACTION

MAIL STOP Amendment

Honorable Commissioner of Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Commissioner:

In response to the Office Action dated December 13 2011, the applicant respectfully submits the following:

Amendments to the Claims are reflected in the listing of

claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 15 of this paper.

Amendments to the Specification:

Please amend the paragraph listed as paragraph 86 in the published application and starting on the bottom of page 16 and continuing onto page 17 of the specification as follows:

The central portion **41** of the base body **29** further comprises a guide groove **48** to receive the element **28,** wherein, with the application of just one element **28,** the base body **29** comprises a slide/guide surface for the welding wire **13** on the opposite side of the guide groove **48.** In the exemplary embodiment illustrated, three elements **28** are, however, preferably arranged in three independent guide grooves **48** in the conically tapering central portion **41** of the base body **29.** The elements **28** are preferably arranged in three guide grooves **48** which are each angularly offset by **1200.** Within the guide grooves **48,** the elements **28** are preferably arranged to be longitudinally and/or vertically displaceable. To this end, the guide grooves **48** are designed to be longer in the longitudinal direction than elements **28.** Hence, it is no longer necessary to provide a slide/guide surface, since the welding wire **13** extends centrically between the elements **28** relatively arranged at **1200** and is centrally positioned and guided by the transport elements **33.** The conical central portion **41,** moreover, comprises at least another bore **49,** in which the above mentioned guide pins **50** can be inserted to position and guide the elements **28** in the base body **29.** At least one bore **49** is required for each element **28** or each guide groove **48,** respectively, since the guide pin **50** inserted in this bore **49** guides the element **28,** in particular cage, while, at the same time, protecting it from falling out during the assemblage of the wire feed device **27.** The element **28,** thus, comprises a guide groove **48,** and the base body **29** comprises at least one guide pin **50** engaging the guide groove **48** of the element **28.** Due to the guide groove **48** extending in parallel with the conically designed thread ~~**37**~~ **137**of the drive sleeve **43,** the base body **29** and the element **28,** the element **28** is displaced parallelly to this conical design within

the guide groove **48.**

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-41 (Canceled).

Claim 42 (Previously Presented) : The wire feed device according to claim 81, wherein at least one guiding element is displaceably arranged in the base body.

Claim 43 (Canceled).

Claim 44 (Previously Presented) : The wire feed device according to claim 81, wherein three guiding elements are arranged about the welding wire.

Claim 45 (Previously Presented) : The wire feed device according to claim 42, wherein the base body centrically arranged in the drive sleeve.

Claim 46 (Previously Presented) : The wire feed device according to claim 45, wherein the drive sleeve is formed with an internal thread adapted to the contour of the transport element and engaged by at least one transport element.

Claim 47 (Previously Presented) : The wire feed device according to claim 46, wherein each of the internal thread of the drive sleeve, the base body and the guiding elements is conically designed.

Claim 48 (Previously Presented) : The wire feed device according to claim 46, wherein the base body comprises a cylindrical projection, wherein the cylindrical projection is mounted in the interior of the drive sleeve.

Claim 49 (Previously Presented) : The wire feed device according to claim 48, wherein the base body, on its side located opposite the projection, comprises a rectangularly designed positioning flange.

Claim 50 (Previously Presented) : The wire feed device according to claim 49, the positioning flange is connected with a retention element in a torque proof manner.

Claim 51 (Previously Presented) : The wire feed device according to claim 50, wherein the drive sleeve is connected with a coupling element, said coupling element being arranged on the opposite side of the retention element.

Claim 52 (Previously Presented) : The wire feed device according to claim 51, wherein the coupling element or the drive sleeve is directly connected with a drive.

Claim 53 (Previously Presented) : The wire feed device according to claim 52, wherein the drive is arranged axially to the wire feed device.

Claim 54 (Previously Presented) : The wire feed device according to claim 53, wherein the drive comprises a hollow shaft, wherein the hollow shaft is connected with the coupling element and wherein the welding wire is passable through the hollow shaft to the wire feed device.

Claim 55 (Previously Presented) : The wire feed device according to claim 52, wherein the drive is rotationally connected with a further retention element.

Claim 56 (Previously Presented) : The wire feed according to claim 42, wherein a pressure element is arranged in the base body so as to be positioned between the positioning flange and the guiding elements and to exert a pressure force onto the guiding elements.

Claim 57 (Previously Presented) : The wire feed device according to claim 42, wherein each guiding element comprises a guide groove and at least one guide pin is arranged on the base body to engage said guide groove of the guiding element.

Claim 58 (Previously Presented) : The wire feed device according to claim 81, wherein each transport element is designed in the form of a ball.

Claim 59 (Previously Presented) : The wire feed device according to claim 45, wherein the drive sleeve has an outer diameter of between 20mm and 30mm.

Claim 60 (Previously Presented) : The wire feed device according to claim 81, wherein the wire feed device is arranged in at least one of a welding torch and a welding apparatus.

Claim 61 (Currently Amended) : A method for feeding a welding wire from a wire storage to a point of consumption, wherein a plurality of guiding elements for guiding the welding wire are arranged in a base body, each guiding element including a guide path along which a plurality of transport elements are successively and displaceably mounted, wherein the guiding elements and the base body are arranged in a drive sleeve to form a drive mechanism connected with at least one transport element of each guiding element, the method comprising the following steps:

guiding ~~a~~ the welding wire through at least one guide element of the guiding elements,

contacting said welding wire with at least one transport element of the plurality of transport elements on a side of the respective guiding element facing the welding wire, wherein said at least one transport element is shaped as a ball;

displacing at least one further transport element of the plurality of transport elements via the drive mechanism on at least one further side of the guiding element, thus causing the transport elements arranged in the guide path to be moved on by said at least one further transport element displaced by the drive mechanism wherein said transport elements move in a circulating manner within the guide path;

displacing at least one guiding element of the plurality of guiding elements for adaptation to the diameter of the welding wire.

wherein the drive sleeve of the drive mechanism is formed with an internal thread adapted to the contour of said transport elements and engaged by at least one transport element of the plurality of transport elements; and

rotating at least a part of said drive mechanism around the welding wire..

Claim 62 (Previously Presented) : The feeding method according to claim 61, wherein each guiding element is displaced in the base body in at least one of a longitudinal and a vertical direction.

Claim 63 (Canceled).

Claim 64 (Previously Presented) : The feeding method according to claim 62, wherein three guiding elements, offset by 120 degrees, are arranged in the base body.

Claim 65 (Previously Presented) : The feeding method according to claim 62, wherein the base body is centrically arranged in the drive sleeve.

Claim 66 (Previously Presented) : The feeding method according to claim 65, wherein at least one transport element engages a thread of the drive sleeve, with a contour of the thread being adapted to a contour of the transport element.

Claim 67 (Previously Presented) : The feeding method according to claim 66, wherein each of the thread of the drive sleeve, the base body and the guiding elements is conically designed.

Claim 68 (Previously Presented) : The feeding method according to claim 66, wherein the base body comprises a cylindrical projection the base body being mounted in the interior of the drive sleeve via the cylindrical projection.

Claim 69 (Previously Presented) : The feeding method according to claim 68, wherein the base body, on its side located opposite the projection, comprises a rectangularly designed positioning flange.

Claim 70 (Previously Presented) : The feeding method according to claim 69, wherein the positioning flange is connected with a retention element in a torque proof manner.

Claim 71 (Previously Presented) : The feeding method according to claim 70, wherein a coupling element s connected with the drive sleeve on the opposite side of the retention element.

Claim 72 (Previously Presented) : The feeding method according to claim 71, wherein the coupling element or the drive sleeve is directly connected with a drive.

Claim 73 (Previously Presented) : The feeding method according to claim 72, wherein the drive is arranged axially to the wire feed device.

Claim 74 (Previously Presented) : The feeding method according to claim 73, wherein the drive is connected with the coupling element via a hollow shaft arranged in the drive, said welding wire being fed through said hollow shaft.

Claim 75 (Previously Presented) : The feeding method according to claim 72, wherein the drive is rotationally connected with a further retention element.

Claim 76 (Currently Amended) : The feeding method according to claim 62, wherein a pressure force is exerted on the guiding element by a pressure element arranged in the base body between the positioning flange and the guiding element.

Claim 77 (Previously Presented) : The feeding method according to claim 62, wherein at least one guide pin arranged on the base body engages a guide groove of the guiding element and the guiding element is displaced via said assembly.

Claim 78 (Previously Presented) : The feeding method according to claim 61, wherein the transport element is designed in the form of a ball.

Claim 79 (Previously Presented) : The feeding method according to claim 65, wherein the drive sleeve has an outer diameter of between 20mm and 30mm.

Claim 80 (Previously Presented) : The feeding method according to claim 86, wherein the wire feed device is arranged in at least one of a welding torch and a welding apparatus.

Claim 81 (Currently Amended): A wire feed device for transporting a welding wire from a wire storage to a point of consumption comprising:

(a) a plurality of guiding elements for guiding the welding wire, each guiding element including a guide path;

(b) a plurality of transport elements which are successively and displaceably mounted inside of said guide path of said guiding element, wherein at least one transport element is formed as a ball;

(c) a base body; and

(d) a drive sleeve connected with at least one transport element of each guiding element, wherein said drive sleeve has an internal thread adapted to the contour of said plurality of transport elements, and engaged by said at least one transport element of said plurality of transport elements

wherein at least one further transport element is connected with the welding wire in at least one of a force locking manner and a form-locking manner;

wherein the base body and the guiding elements are arranged in the drive sleeve; and wherein at least one guiding element is displaceably arranged to adapt to a diameter of the welding wire and comprises ~~a~~ said guide path wherein said plurality of transport elements move in a circulating manner within said guide path; and

wherein said drive sleeve is configured to rotate around the welding wire..

Claim 82 (Previously Presented) : The wire feed device according to claim 44, wherein the guiding elements are offset by an angle of 120 degrees.

Claim 83 (Previously Presented) : The wire feed device according to claim 48, wherein the base body is mounted in the interior of the drive sleeve via a bearing assembly.

Claim 84 (Previously Presented) : The wire feed device according to claim 52, wherein the drive connecting the coupling element or the drive sleeve is an electromotor.

Claim 85 (Previously Presented) : The wire feed device according to claim 55, wherein the drive comprises a drive casing rotationally connected with the further connection element.

Claim 86 (Previously Presented) : The feeding method according to claim 68, wherein the base body is mounted in the interior of the drive sleeve via a bearing assembly.

Claim 87 (Previously Presented) : The feeding method according to claim 72, wherein the drive is an electromotor.

Claim 88 (Previously Presented) : The feeding method according to claim 75, wherein the drive comprises a drive casing rotationally connected with the further connection element.

89. (Currently Amended) The method as in claim 61, wherein said guide path of said guide element is contoured to a shape of at least one of said plurality of transport elements and wherein said plurality of transport elements are displaceable around said guide path of said guide element from at least a first position to a second position.

90. (Canceled)

91. (Previously Presented) The wire feed device as in claim 81, wherein said guide path of said guide element is contoured to a shape of at least one of said plurality of transport elements wherein said plurality of transport elements are displaceable around said guide path of said guide element from at least a first position to a second position.

92. (Canceled)

93. (Currently Amended) A method for feeding a welding wire from a wire storage to a point of consumption, wherein a plurality of guiding elements for guiding the welding wire are

arranged in a base body, each guiding element including a guide path along which a plurality of transport elements are successively and displaceably mounted, wherein the guiding elements and the base body are arranged in a drive sleeve to form a drive mechanism connected with at least one transport element of each guiding element, the method comprising the following steps:

guiding the welding wire through at least one guide element of the plurality of guide elements,

contacting said welding wire with at least one transport element of the plurality of transport elements on a side of the respective guiding element facing the welding wire, wherein said at least one transport element is formed in a shape comprising at least one of: balls, rollers, oval shaped cylinders, or circular shaped cylinders;

displacing at least one further transport element of the plurality of transport elements via the drive mechanism on at least one further side of the guiding element, thus causing the transport elements arranged in the guide path to be moved on by said at least one further transport element of the plurality of transport elements displaced by the drive mechanism;

displacing at least one guiding element of the plurality of guiding elements for adaptation to the diameter of the welding wire;

rotating the drive mechanism around the welding wire.

wherein the drive mechanism has ~~a~~ said drive sleeve that is formed with an internal thread adapted to the contour of said transport elements and engaged by said at least one transport element of the plurality of transport elements wherein said plurality of transport elements move in a circulating manner within the guide path from at least a first position to a second position along said guide path.

94. (Currently Amended) A wire feed device for transporting a welding wire from a wire storage to a point of consumption comprising:

(a) a plurality of guiding elements for guiding the welding wire, each guiding element including a guide path;

(b) a plurality of transport elements which are successively and displaceably mounted inside of said guide path of said guiding element, wherein said at least one transport element is formed in a shape comprising at least one of:

balls, rollers, oval shaped cylinders, or circular shaped cylinders

(c) a base body; and

(d) a drive sleeve connected with at least one transport element of each guiding element, wherein said drive sleeve has an internal thread adapted to the contour of said plurality of

transport elements, and engaged by at least one transport element of said plurality of transport elements;

wherein at least one further transport element is connected with the welding wire in at least one of a force locking manner and a form-locking manner;

wherein the base body and the guiding elements are arranged in the drive sleeve; and wherein at least one guiding element is displaceably arranged to adapt to a diameter of the welding wire wherein said transport elements move in a circulating manner within said guide path from at least a first position to a second position along said guide path;

a drive mechanism configured to rotate about the welding wire.

95. (Currently Amended) The method as in claim 61, further comprising the step of driving the guide sleeve to drive said transport elements within ~~a~~ said thread of said guide sleeve, to guide said transport elements within said guide path to form a plurality of pressure points on the welding wire while feeding the welding wire wherein said step of displacing the transport elements comprises displacing the transport elements along a closed guide path.

96. (Currently Amended) The device as in claim 81, wherein said drive sleeve ~~further~~ comprises ~~a~~ said thread, and wherein the device further comprises a drive coupled to said drive sleeve, said drive being configured to drive said drive sleeve to drive said transport elements within said thread of said drive sleeve to guide said transport elements in said guide path via said

drive sleeve to form a plurality of pressure points on the welding wire while feeding the welding wire wherein said guiding elements form a closed guide path for said transport elements.

97. (Currently Amended) The method as in claim 93, further comprising the step of driving the guide sleeve to drive said transport elements within said ~~a~~ thread of said guide sleeve, to guide said transport elements within said guide path to form a plurality of pressure points on the welding wire while feeding the welding wire wherein said step of displacing the transport elements comprises displacing the transport elements along a closed guide path.

98. (Currently Amended) The device as in claim 94, wherein said drive sleeve ~~further~~ comprises ~~a~~ said thread, and wherein the device further comprises a drive coupled to said drive sleeve, said drive being configured to drive said drive sleeve to drive said transport elements within said thread of said drive sleeve to guide said transport elements in said guide path via said drive sleeve to form a plurality of pressure points on the welding wire while feeding the welding wire wherein said guiding elements form a closed guide path for said transport elements.

Remarks:

Reconsideration of this patent application is respectfully requested in view of the foregoing amendments and the following remarks.

Claims 42, 44-60, 81-85, 91, 93, and 95-98 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims have been amended to overcome these rejections. For example, in claims 96 and 98 the term "drive" is used and this drive is supported by way of example by a drive 37 as mentioned in the specification and in the abstract.

In addition, the specification has been amended as well as the drawings have been amended so that the thread 37 is now thread 137. FIGS. 16, 17, and 18 have also been amended.

Claims 42, 44-62, 64-89, 91, and 93-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger (GB 2016984 A) in view of Schach et al. (WO 2004028702 A1, used US Pub. No. US 20060124762 A), Sugiyama (GB 2174942 A), and Cornell Jr. (US 3338492).

It is respectfully submitted that the present invention as claimed in claims 61, 81, 93 and 94 is substantially different from the above cited documents taken either singularly or in combination.

For example, claim 61 includes the following passage:

rotating at least a part of said drive mechanism around the welding wire..

In addition claim 81 includes the following:

wherein said drive sleeve is configured to rotate around the welding wire..

Claim 93 includes the following:

rotating the drive mechanism around the welding wire.

Furthermore claim 94 includes the following:

a drive mechanism configured to rotate about the welding wire.

It is respectfully submitted that the above cited documents, do not disclose this feature. Support for this amendment is found on page 15 lines 2-15 as follows:

> *By rotating the drive means 37, the respective transport element 33 engaging the thread 36 is conveyed in the peripheral guide path 32 of the element 28 or half-shells 30. The rotation of the thread 36, thus, causes a displacement of the engaging transport element 33, which, in turn, causes the other transport elements 33 to be displaced too. Advantageously, several transport elements 33 engage the thread 36 simultaneously so as to ensure the safe displacement of the transport elements 33 along the guide path 32. With such a construction, in which several transport elements 33 act on the welding wire 13 at the same time, it is achieved in an advantageous manner that several pressure points are formed on the welding wire 13 so as to ensure the safe feeding of the welding wire 13.*

The cited patents do not disclose the above identified features of claims 61, 81, 93 and 94. For example, Berger (GB 2016984 A) does not indicate that the drive shaft 11 rotates around the wire. In addition Berger includes rotating discs on spindles, these rotating discs do not move along a guide path such that they are movable from at least a first position to a second position as claimed in claims 89, 91, 93, and 94.

Furthermore claims 95-98 have also been amended. It is respectfully submitted that the element that the transport elements are guided along a closed guide path is not disclosed in the above cited patents. Furthermore, it is submitted that the following step:

wherein said step of displacing the transport elements comprises displacing the transport elements along a closed guide path.

These features are shown in the drawings, particularly FIGS. 32, 34, and 36. This feature is also not disclosed in the above cited patents. Therefore, for this additional reason, it is respectfully submitted that these claims are patentable as well.

In conclusion, claims 61, 81, 89, 91, and 93-98 have been amended. No new matter has been added. Accordingly early allowance of the remaining claims is respectfully requested.

Respectfully Submitted,

/William Collard/

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